Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1–2 (canceled)

Claim 3 (new) A system for spectroscopically differentiating fluid flowing in a conduit, the system comprising:

a light source for producing light suitable for Raman spectroscopy;

a sample cell mounted adjacent the conduit, the sample cell having a first opening, through which fluid diverted from the conduit enters the sample cell, and a second opening, through which fluid returned to the conduit exits the sample cell, the sample cell having portions allowing light from the light source to impinge on the fluid contained therein;

a Raman spectrometer for receiving the light scattered from the fluid, the Raman spectrometer is mounted with the sample cell adjacent the conduit, and the Raman spectrometer generating an optical signal corresponding to the scattered light;

an optical detection device for converting the optical signal to an electronic signal; and

a computer device for processing the electronic signal to differentiate the fluid flowing in the conduit.

Claim 4 (new) The system of claim 3, wherein the light source and optical device are mounted with the sample cell adjacent the conduit.

Claim 5 (new) The system according to claim 4, wherein the sample cell, light source, Raman spectrometer, and optical device are housed in an explosion proof box, the explosion proof box mounted adjacent to the conduit.

Claim 6 (new) The system of claim 4, wherein the light source includes a diode laser.

Claim 7 (new) The system of claim 6, further comprising at least one mirror placed outside the sample cell to increase the number of times that the light impinges on the fluid.

Claim 8 (new) The system of claim 7, wherein the optical detection device is a photomultiplier tube.

Claim 9 (new) A system for spectroscopically differentiating fluid flowing in a conduit, the system comprising:

a light source capable of operating in more than one mode for producing light suitable for Raman spectroscopy;

an external cavity device for locking a single mode of the light source;

a sample cell having a first opening, through which fluid diverted from the conduit enters the sample cell, and a second opening, through which fluid returned to the conduit exits the sample cell, the sample cell having portions allowing light from the mode-locked light source to impinge on the fluid contained therein;

a Raman spectrometer for receiving the light scattered from the fluid, the Raman spectrometer generating an optical signal corresponding to the scattered light;

an optical detection device for converting the optical signal to an electronic signal; and

a computer device for processing the signal to differentiate the fluid flowing in the conduit.

Claim10 (new) The system of claim 9, wherein the light source includes a diode laser.

Claim 11 (new) The system of claim 10, wherein the external cavity device provides frequency-selective optical feedback for locking the single mode.

Claim 12 (new) The system of claim 11, wherein the diode laser and the external cavity device cooperate to form a mode-locked external cavity laser that emits substantially monochromatic light with a spectral resolution of about 0.2 nm.

Claim 13 (new) The system of claim 12, further comprising mirrors placed outside the sample cell to increase the number of times that the light impinges on the fluid.

Claim 14 (new) The system of claim 13, wherein the optical detection device is a photomultiplier tube.

Claim 15 (new) The system of claim 14, wherein the system is installed *in-situ* on a working conduit.

Claim 16 (new) A system for spectroscopically differentiating fluid flowing in a conduit, the system comprising:

a light source for producing light suitable for Raman spectroscopy;

a sample cell having a first opening, through which fluid diverted from the conduit enters the sample cell, and a second opening, through which fluid returned to the conduit exits the sample cell, the sample cell having portions allowing light from the light source to impinge on the fluid contained therein;

a Raman spectrometer for receiving the light scattered from the fluid, the Raman spectrometer generating a Raman spectrum corresponding to the scattered light;

a computer device for determining whether the fluid is gasoline by comparing the Raman spectrum to a reference set of spectra, each member of the set of spectra corresponding to a compound characteristic of gasoline; and

a fluorescence detector, for measuring the fluorescence of the fluid, wherein if the computer device determines that the fluid is not gasoline, an output value is provided that is a function of the fluorescence and that is indicative of the identity of the fluid, and if the computer device determines that the fluid is gasoline, the computer device performs a further analysis on the fluid to gain information about the identity thereof.

Claim 17 (new) The system of claim 16 wherein if the computer device determines that the fluid is gasoline, the computer device compares the Raman spectrum to a previous Raman spectrum of the fluid in the conduit obtained a pre-determined amount of time prior to the generation thereof, thereby determining if the fluid that yielded the Raman spectrum is substantially the same as the fluid that yielded the previous Raman spectrum.

Claim 18 (new) The system of claim 17, wherein if the computer device determines that the fluid is gasoline, the computer device calculates an output value, *V*, which provides information about the identity of the fluid, the output value given by

$$V = C_{M,\text{previous}} + 1.0 + 5(1 - R_{pp}) \text{ if } C_{M,\text{new}} - C_{M,\text{previous}} \geq 0 \text{ and } R_{pp} > R_{\text{thresh}}$$

$$V = C_{M,\text{previous}} + 1.0 - 5(1 - R_{pp}) \text{ if } C_{M,\text{new}} - C_{M,\text{previous}} < 0 \text{ and } R_{pp} > R_{\text{thresh}}$$

$$V = C_{M,\text{new}} + 1.0 + 5(1 - R_{pp}) \text{ if } C_{M,\text{new}} - C_{M,\text{previous}} \geq 0 \text{ and } R_{pp} \leq R_{\text{thresh}}$$

$$V = C_{M,\text{new}} + 1.0 - 5(1 - R_{pp}) \text{ if } C_{M,\text{new}} - C_{M,\text{previous}} < 0 \text{ and } R_{pp} \leq R_{\text{thresh}}$$

where R_{PP} is a correlation coefficient between the Raman spectrum and the previous spectrum, R_{thresh} is a pre-defined cut-off, $C_{M,\text{new}}$ is a moving constant that is computed from the Raman spectrum and $C_{M,\text{previous}}$ is a moving constant that is computed from the previous Raman spectrum.

Claim 19 (new) The system of claim 18, wherein the light source includes a diode laser.

Claim 20 (new) The system of claim 19, wherein the external cavity device provides frequency-selective optical feedback for locking a single mode of the diode laser.

Claim 21 (new) The system of claim 20, wherein the diode laser and the external cavity device cooperate to form a mode-locked external cavity laser that emits substantially monochromatic light with a spectral resolution of about 0.2 nm.

Claim 22 (new) The system of claim 21, further comprising at least one mirror placed outside the sample cell to increase the number of times that the light impinges on the fluid.

Claim 23 (new) The system of claim 22, wherein the optical detection device is a photomultiplier tube.

Claim 24 (new) The system of claim 22, wherein the system is installed *in-situ* on a working conduit.

Claim 25 (new) A method for spectroscopically differentiating fluid flowing in a conduit, the method comprising

diverting fluid from the conduit to a sample cell mounted adjacent the conduit;

producing light with a light source suitable for Raman spectroscopy;

allowing light from the light source to impinge on the fluid contained in the sample cell;

providing a Raman spectrometer for receiving the light scattered from the fluid, the Raman spectrometer mounted with the sample cell adjacent the conduit;

the Raman spectrometer generating a signal corresponding to the scattered light; and

processing the signal to differentiate the fluid flowing in the conduit.

Claim 26 (new) The method of claim 25, wherein the light source and optical device are mounted with the sample cell adjacent the conduit.

Claim 27 (new) The method of claim 26, wherein, in the step for producing light, the light source includes a diode laser.

Claim 28 (new) The method of claim 27, further comprising placing at least one mirror outside the sample cell to increase the number of times that the light impinges on the fluid.

Claim 29 (new) A method for spectroscopically differentiating fluid flowing in a conduit, the method comprising:

diverting fluid from the conduit to a sample cell;

producing light suitable for Raman spectroscopy with a light source capable of operating in more than one mode;

locking a single mode of the light source;

allowing light from the mode-locked light source to impinge on the fluid contained in the sample cell;

providing a Raman spectrometer for receiving the light scattered from the fluid;

the Raman spectrometer generating a signal corresponding to the scattered light; and

processing the signal to differentiate the fluid flowing in the conduit.

Claim 30 (new) The method of claim 29, wherein, in the step of producing light, the light source includes a diode laser.

Claim 31 (new) The method of claim 30, wherein, in the step of locking a single mode, an external cavity device provides frequency-selective optical feedback.

Claim 32 (new) The method of claim 31, wherein, in the step of locking a single mode, the diode laser and the external cavity device cooperate to form a mode-locked external cavity laser that emits substantially monochromatic light with a spectral resolution of about 0.2 nm.

Claim 33 (new) The method of claim 32, further comprising placing at least one mirror outside the sample cell to increase the number of times that the light impinges on the fluid.

Claim 34 (new) The method of claim 33, further comprising installing the system *in-situ* on a working conduit.

Claim 35 (new) A method for spectroscopically differentiating fluid flowing in a conduit, the system comprising:

diverting fluid from the conduit to a sample cell;

producing light with a light source suitable for Raman spectroscopy;

allowing light from the light source to impinge on the fluid contained in the sample cell;

providing a Raman spectrometer for receiving the light scattered from the fluid;

the Raman spectrometer generating a Raman spectrum corresponding to the scattered light;

determining whether the fluid is gasoline by comparing the Raman spectrum to a reference set of spectra, each member of the set of spectra corresponding to a compound characteristic of gasoline;

measuring the fluorescence of the fluid;

if the fluid is not gasoline, calculating an output value that is a function of the fluorescence and that is indicative of the identity of the fluid; and

if the fluid is gasoline, performing further analyses on the fluid to gain information about the identity thereof.

Claim 36 (new) The method of claim 35, wherein the step of performing further analyses includes:

comparing the Raman spectrum to a previous Raman spectrum of the fluid in the conduit obtained a pre-determined amount of time prior to the generation thereof; and

determining if the fluid that yielded the Raman spectrum is substantially the same as the fluid that yielded the previous Raman spectrum.

Claim 37 (new) The method of claim 36, wherein the step of performing further analyses includes:

calculating an output value, V, which provides information about the identity of the fluid, the output value given by

$$V = C_{M,\text{previous}} + 1.0 + 5(1 - R_{pp}) \text{ if } C_{M,\text{new}} - C_{M,\text{previous}} \geq 0 \text{ and } R_{pp} > R_{\text{thresh}}$$

$$V = C_{M,\text{previous}} + 1.0 - 5(1 - R_{pp}) \text{ if } C_{M,\text{new}} - C_{M,\text{previous}} < 0 \text{ and } R_{pp} > R_{\text{thresh}}$$

$$V = C_{M,\text{new}} + 1.0 + 5(1 - R_{pp}) \text{ if } C_{M,\text{new}} - C_{M,\text{previous}} \geq 0 \text{ and } R_{pp} \leq R_{\text{thresh}}$$

$$V = C_{M,\text{new}} + 1.0 - 5(1 - R_{pp}) \text{ if } C_{M,\text{new}} - C_{M,\text{previous}} < 0 \text{ and } R_{pp} \leq R_{\text{thresh}}$$

where R_{PP} is a correlation coefficient between the Raman spectrum and the previous spectrum, R_{thresh} is a pre-defined cut-off, $C_{M,\text{new}}$ is a moving constant that is computed from the Raman spectrum and $C_{M,\text{previous}}$ is a moving constant that is computed from the previous Raman spectrum.

Claim 38 (new) The method of claim 37, wherein, in the step of producing light, the light source includes a diode laser.

Claim 39 (new) The method of claim 38, wherein, in the step of locking a single mode, an external cavity device provides frequency-selective optical feedback.

Claim 40 (new) The method of claim 39, wherein, in the step of locking a single mode, the diode laser and the external cavity device cooperate to form a mode-locked external

cavity laser that emits substantially monochromatic light with a spectral resolution of about 0.2 nm.

Claim 41 (new) The method of claim 40, further comprising placing at least one mirror outside the sample cell to increase the number of times that the light impinges on the fluid.

Claim 42 (new) The method of claim 41, further comprising installing the system *in-situ* on a working conduit.

Claim 43 (new) The method of claim 35, wherein, in the step of determining, the compound includes at least one of mono-substituted benzene, meta-substituted benzene, tri-substituted benzene, para-substituted benzene, branched alkanes and cyclic alkanes.